

REMARKS/ARGUMENTS

Reconsideration of the present application, as amended, is respectfully requested.

A. Status of the Claims

As a result of the present amendment, claims 1, 2, 4, 5 and 7-30 are presented for continued prosecution.

Claim 1 has been amended to clarify that the solvent-based dispersion is an organic solvent-based dispersion. Support for this amendment can be found, for example, in lines 24-27 on page 9 of the application.

Claim 1 has also been amended to clarify that acid number of the polymer is less than about 200 when the dispersion is water-based. Support for this amendment can be found, for example, in lines 6-7 on page 6 of the application.

Claim 1 has been amended to recite that the water-based or organic solvent-based dispersion can be printed onto a surface of a substrate to render it anti-microbial or otherwise more resistant to bacteria. Support for this amendment can be found, for example, in lines 26-31 on page 5 of the application.

B. Claim Rejections under 35 U.S.C. § 112, second paragraph

Claims 1, 2, 4, 5 and 7-30 had been rejected as indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner stated that it is unclear what kind of solvent is being claimed by the solvent-based dispersion compared to the water-based dispersion, because water can be considered a solvent.

Applicant has amended claim 1 to clarify that the solvent-based dispersion is an organic solvent-based dispersion. It is believed that amended claim 1 clearly described the invention and complies with § 112.

C. Claim Rejections under 35 U.S.C. § 103(a)

Claims 1, 2, 7, 8, 14-18 and 29 had been rejected as being unpatentable over Yokota (U.S. 5,783,570). Claims 1, 2, 7-12, 14-19, 21-25 and 29 had been rejected as being

unpatentable over Sakai (U.S. 5,280,054). Claims 4, 5, 20, 26-28 and 30 had been rejected as being unpatentable over Yokota in view of Lindgren (U.S. 5,603,997).

The present application contains independent product claim 1 and independent method claims 19 and 29. Applicant will separately address the prior art rejections for each independent claim in the following sections.

1. Sakai does not teach or suggest the printing step of claim 19

Claim 19 recites a method of applying an anti-microbial treatment to a surface of a packaging material. This method includes the step of printing a dispersion of claim 1 onto a surface of the packaging material. Sakai is the only reference cited as allegedly teaching the printing step of method claim 19.

In lines 6-12 on page 6 of the Office Action, the Examiner stated that the composition of Sakai can be applied by methods including dip coating, shower coating, spray coating, roll coating and the like. It was the Examiner's position that the printing step of claim 19 includes the coating methods of Sakai. Applicant respectfully disagrees.

Printing is a unique method that differs from the coating methods described in Sakai. Printing includes techniques such as rotogravure, flexography, offset, lithography, and inkjet printing. When printing with these techniques, one must consider many properties that are not recognized by the general coating methods of Sakai. Attached is a Declaration of Dr. Jose M. Lorenzo which includes a detailed explanation of some of the different properties that must be considered when printing a dispersion. In light of the explanation provided by Dr. Lorenzo, Applicant respectfully submits that it would not be obvious to print a dispersion based on the teachings of Sakai.

Dr. Lorenzo explained in sections 8-9 of the Declaration that physicochemical properties of the dispersion must be considered when printing. He explains that stable printable dispersions cannot be obtained if polymers and zeolites are arbitrarily combined. This is in part because polymeric dispersions with particles are highly non-linear systems and small changes in concentration can result in dramatic changes in physical properties, including phase transitions. Dr. Lorenzo explained in section 8 that different equipment is employed when printing compared to using the coating methods of Sakai. Operators of such equipment would have to learn how to design the equipment and process to obtain the target settings, and would also have to learn how

to obtain stable dispersions with the required physicochemical properties. The importance of the physicochemical properties of the dispersion and the equipment parameters are not mentioned in the general description of coating offered by Sakai. Sakai therefore lacks any teaching or suggestion on any of the important factors that are considered when printing a dispersion.

Dr. Lorenzo also provided exemplary data which shows that the acid number of the polymer and the viscosity of the dispersion are relevant physicochemical properties that affect the stability and consequently the printability of a dispersion. As summarized by the table in section 13 of the Declaration, dispersions with polymers having acid numbers above 200 were unstable and not printable, while dispersions with polymers having acid numbers below 200 were stable and printable. This data evidences that the acid number of the polymer influences the stability of the dispersion and its printability. This property of the dispersion which is recited in claim 1 is not described as being important in Sakai, and is not even mentioned in the description of the coating methods of Sakai. Based on this lack of disclosure in Sakai, the skilled artisan would not understand that the acid number of the polymer affects the stability of the dispersion and its printability. As a result, the skilled artisan following the teachings of Sakai would be unable to satisfactorily print a stable dispersion.

In addition to the data concerning the acid number of the polymer, Dr. Lorenzo demonstrated in section 15 of the Declaration that the viscosity of the dispersion must dramatically change depending on the employed printing technique. Thus, even with the knowledge that a dispersion can be printed, the skilled artisan must still further be able to adapt the viscosity of the dispersion to the chosen printing technique. This knowledge of how to adjust the dispersion viscosity when printing is not gained by a reading of Sakai. Sakai is silent on the effect that viscosity has on any technique, and more importantly Sakai is silent on the effect that viscosity has on individual dispersion printing techniques.

In summary, Dr. Lorenzo explained in section 16 of the Declaration that the Applicant did not merely optimize parameters that were considered relevant by Sakai. One of the aspects of the invention is the discovery that a printable dispersion can be obtained when considering the acid number of the polymer. This aspect of the invention is recited in method claim 19. In section 16 of the Declaration, Dr. Lorenzo as one of skill in the art expressed his opinion that printing a dispersion with a polymer having an acid number within the claimed range would not

be obvious based on the teachings of Sakai. Applicant therefore respectfully submits that claim 19 is patentable over the teachings of Sakai.

2. Yokota and Sakai do not teach or suggest the printable dispersion of claim 1

Claim 1 recites a zeolite-containing water-based or organic solvent-based dispersion having a polymer with an acid number of less than about 200 when the dispersion is water-based. As explained above, claim 1 has been amended to recite that the composition is a dispersion which can be printed onto a surface of a substrate to render the surface of the substrate anti-microbial or otherwise more resistant to bacteria.

Independent claim 1 had been rejected as being unpatentable over either Yokota or Sakai. In order to maintain an obviousness rejection under 35 U.S.C. § 103, the differences between the claimed invention and the prior art must be obvious to a person of ordinary skill in the art at the time the claimed invention was made. Applicant respectfully submits that Yokota and Sakai do not render the claim 1 obvious for at least the following reasons.

In lines 16-17 on page 3 of the Office Action and in lines 1-2 on page 6 of the Office Action, the Examiner cited polymers of Yokota and polymers of Sakai to teach the claimed polymer having an acid number less than about 200. However, in lines 3-6 on page 4 of the Office Action, the Examiner acknowledged that Yokota does not specifically teach the claimed acid number of the polymer. Although not directly addressed by the Examiner, Sakai also does not specifically teach the claimed acid number of the polymer.

As explained by Dr. Lorenzo in the attached Declaration, the acid number of the polymer is a critical property that must be considered in order to obtain a printable dispersion. Applicant directs the Examiner to section 1 above which summarizes the data presented by Dr. Lorenzo in the Declaration. In sum, Dr. Lorenzo established that a dispersion with a polymer having an acid numbers above the claimed range is unstable and cannot be printed.

Yokota and Sakai disclose a large number of polymers (see col. 6, lines 10-24 of Yokota and col. 5, lines 10-33 of Sakai). However, Yokota and Sakai are silent as to the acid number of these polymers. Thus, if one were to select a polymer from either Yokota or Sakai, the selected polymer might have an acid number above the claimed range and consequently the dispersion would be unsuitable for printing.

The dispersion of claim 1 is believed to be unobvious based on the teachings of Yokota and Sakai. Yokota and Sakai do not explain the significance of selecting a polymer with an acid number less than about 200. Moreover, Yokota and Sakai do not teach or suggest that the acid number of the polymer significantly affects the printability of a dispersion as demonstrated in Dr. Lorenzo's Declaration. Still further, Sakai does not teach printing a dispersion for the reasons explained above, and Yokota has not been cited for this teaching. It is therefore believed that the differences between claim 1 and the cited references, namely a printable dispersion with a polymer having an acid number less than about 200, would not have been obvious to a person of ordinary skill in the art at the time the claimed invention was made. Applicant respectfully submits that claim 1 is patentable over Yokota and Sakai.

3. Yokota and Sakai do not teach or suggest the applying the printable dispersion of claim 29

Claim 29 recites that the printable dispersion of claim 1 is applied onto a surface of a substrate.

For the reasons described in section 2 above, Applicant respectfully submits that Yokota and Sakai do not teach or suggest the printable dispersion of claim 1. As a result, Yokota and Sakai do not teach or suggest method claim 29 which recites the step of applying the dispersion of claim 1 onto a substrate. It is therefore believed that claim 29 is patentable over the teachings of Yokota and Sakai.

4. Rejections to the dependent claims and Lindgren

Lindgren had been cited to teach some of the limitations of the dependent claims. Dependent claims 2, 4, 5 and 7-18, 20-28 and 30 ultimately depend on either independent claims 1, 19 or 29. For the reasons explained above, it is respectfully submitted that the independent claims and the claims dependent thereon are all patentable over the cited references.

D. Extension of Time

This Response is being filed within four months from the mailing date of the Office Action. A one month extension of time is requested. No further fee is believed to be due. If, on the other hand, it is determined that further fees are due or any overpayment has been made, the

Assistant Commissioner is hereby authorized to debit or credit such sum to Deposit Account No. 02-2275. Pursuant to 37 C.F.R. 1.136(a)(3), please treat this and any concurrent or future reply in this application that requires a petition for an extension of time for its timely submission as incorporating a petition for extension of time for the appropriate length of time. The fee associated therewith is to be charged to Deposit Account No. 02-2275.

E. Conclusion

In view of the actions taken and arguments presented, it is respectfully submitted that each and every one of the matters raised by the Examiner has been addressed by the present amendment and that the present application is now in condition for allowance.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

LUCAS & MERCANTI, LLP

By: 

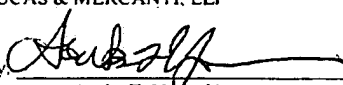
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I hereby certify that this document is being electronically transmitted to the Commissioner for Patents on July 11, 2008.

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Attached: Declaration of Dr. Jose M. Lorenzo